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THE REVISED ASTROMETRIC-PHOTOMETRIC CATALOG.(U)  
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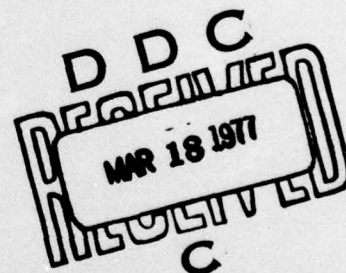
MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
LINCOLN LABORATORY

THE REVISED ASTROMETRIC-PHOTOMETRIC CATALOG

L. G. TAFF  
Group 94

PROJECT REPORT ETS-7

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# ABSTRACT

A revised version of the original, combined astrometric-photometric catalog (Taff 1975) for epoch 1977.0 is described. Principal changes include a doubling of the size of the catalog, the inclusion of parallaxes, and the inclusion of radial velocities.

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## I. INTRODUCTION

Taff (1975) compiled a non-fundamental combined astrometric-photometric catalog based on the FK4 (Fricke and Kopff 1963). The usefulness of the catalog has been demonstrated. Furthermore, additional tasks to be performed at the ETS require a more extensive, homogeneous catalog. Hence, Taff (1975) has been revised, enlarged, and expanded.

## II. CATALOG CONTENTS

The contents of the catalog can be divided into three parts. First there are multiple identifications for the stars which must be cross-referenced. Second there is the astrometric information and third there is the photometric and spectral type information. We discuss the sources for each of these in turn. Table 1 contains a sample page from the catalog. The epoch is 1977.0 (see Taff 1976a, b).

The stars in the FK4 are all bright ( $m_v \leq 7.0$ ). Bright stars appear in many different catalogs compiled for many different reasons (e.g., parallax, radial velocity, photometry, positions, etc.). Usually each catalog gives the star its own (unique) identification number. Thus, since the brighter stars also have names given by Bayer or Flamsteed, the identification of 35 Vir as HD 111239 = FK4 1330 = GC 17381 = HR 4858 is non-trivial. Since the FK4 was the primary source catalog we have included FK4 identification. The other major astrometric catalog is that of Boss (1936). This is also known as the General Catalog so GC numbers are listed too. The major bright star catalog is that of Yale (Hoffleit, 1964) and this is the identification system used in the only large scale, homogeneous UBVRI catalog. Hence the BS = HR numbers are listed. Finally, the most complete spectral type catalog (and the one cross-referenced most frequently) is the Henry Draper Catalog (1918-1925) so HD numbers are also included. The Durchmusterung numbers (DM) in Taff (1975) have been dropped.

All of the positional and proper motion data come from the FK4 itself. Parallaxes were supplied by the U.S. Naval Observatory and their principal source is the catalogs of Jenkins (1952, 1963). The radial velocities were

almost all taken from Wilson (1953). The very few others were found in Abt and Biggs (1972).

The source for the UBVRI photometry was Johnson et al. (1966). Values followed by an asterisk denote data obtained from the catalog of Blanco et al. (1968) or using the revised Harvard magnitudes contained in the Yale Bright Star Catalog (Hoffleit, 1964). No averages were used. Spectral types have come from a variety of sources and an effort was made to insure that they were on the MK system (Johnson and Morgan, 1953).



### III. COMPLETENESS

The catalog is complete with regard to positions, proper motions, and cross-references. Since all FK4 stars have HD numbers a spectral type is always available though not necessarily reliable. Approximately 1300 of the 1535 FK4 stars have MK spectral types. V photometry is available for 1497 stars, BV photometry for 1244 stars, UBV photometry for 1203 stars. UBVRI photometry is available for 761 stars and for about one-half of the catalog Stromgren intermediate-band (uvby) and narrow band H $\beta$  photometry can be found. Less than 100 stars have no radial velocity and about half have parallaxes.



#### IV. PRINCIPAL USES

Since we do not yet (i.e., late 1976) have a large number of stars observed in our own photometric system the Johnson (1963) wide-band system has served as an intermediary. Thus, estimates of artificial satellite apparent visual magnitudes, telescope-camera sensitivity, etc., have been facilitated (Taff, 1976c). In addition, the effects of magnitude and color on the local astrometric calibration scheme have been quantified. The catalog is available from the author.

TABLE 1

NAME	RA			MURA		DEC		MUDEC	PI	VR
	HR	MIN	SEC	SEC/CENT	DEG	MIN	SEC	" /CENT	"	KM/SEC
2 CET	0	2	33.700	0.172	-17	27	50.41	-0.40	0.000	+ 4.0
45G TUC	0	3	32.134	0.785	-71	33	53.94	-1.25	0.000	+ 0.0
33 PSC	0	4	9.438	-0.077	- 5	50	10.38	9.36	0.000	- 6.1
9G CET	0	5	39.512	0.722	-23	14	6.98	-3.84	0.000	+ 3.0
AIP AND	0	7	11.670	1.039	+28	57	48.74	-15.83	0.024	- 11.8
BET CAS	0	7	56.443	6.816	+59	1	22.85	-17.67	0.072	+ 11.8
EPS PHE	0	8	14.863	1.233	-45	52	27.67	-17.71	0.059	- 9.2
22 AND	0	9	7.111	0.063	+45	56	39.83	0.49	0.000	- 5.4
KAP2 SCL	0	10	24.427	0.087	-27	55	40.22	2.04	0.000	- 5.7
THE SCL	0	10	33.929	1.351	-35	15	42.43	12.61	0.027	- 1.7
GAM PEG	0	12	2.914	0.017	+15	3	20.82	-0.74	0.000	+ 4.1
CHI PEG	0	13	24.556	0.669	+20	4	44.03	0.49	0.000	- 45.8
SIG AND	0	17	7.238	-0.525	+36	39	28.54	-3.50	0.015	- 8.0
PI 0 38	0	17	25.910	0.458	+31	23	22.75	-0.08	0.000	- 5.3
10T CET	0	18	15.296	-0.129	- 8	57	4.74	-3.06	0.010	+ 18.6
2ET TUC	0	18	52.910	26.978	-65	0	35.77	116.73	0.134	+ 8.8
-18 41	0	18	52.990	0.339	-17	49	41.02	-0.44	0.000	
41 PSC	0	19	24.709	-0.024	+ 8	3	45.46	1.35	0.000	+ 15.9
RHO AND	0	19	54.251	0.512	+37	50	28.99	-3.38	0.015	+ 9.1
44 PSC	0	24	13.344	-0.100	+ 1	48	44.65	-1.17	0.000	- 4.1
BET HYI	0	24	33.978	68.007	-77	23	1.48	32.73	0.153	+ 22.5
ALP PHE	0	25	6.994	1.866	-42	25	51.05	-39.02	0.035	+ 74.7
PI 0 7A	0	26	50.471	0.263	-11	47	9.30	-1.07	0.000	
48 PSC	0	27	0.812	0.126	+16	19	4.84	-1.10	0.000	- 7.0
12 CET	0	28	51.838	0.051	- 4	5	3.34	-0.74	0.000	+ 4.7
49G CET	0	29	13.693	-0.177	-23	54	53.18	1.87	0.012	+ 0.0
LAM1 PHE	0	30	18.594	1.426	-48	55	50.00	2.60	0.019	- 4.0
KAP CAS	0	31	40.742	0.024	+62	48	18.41	0.28	0.000	- 2.3
77G SCL	0	32	32.850	-0.190	-29	41	5.98	-2.95	0.000	
54G PHE	0	33	22.334	2.450	-52	30	0.48	3.58	0.000	+ 34.8
ZET CAS	0	35	40.829	0.211	+53	46	14.14	-0.49	0.000	+ 1.9
PI AND	0	35	38.833	0.127	+33	35	34.60	-0.01	0.000	+ 8.7
EPS AND	0	37	20.134	-1.741	+29	11	13.62	-24.90	0.031	- 83.6
DEL AND	0	38	5.602	1.065	+30	44	7.47	-8.37	0.024	- 7.3
AIP CAS	0	39	11.509	0.637	+56	24	41.39	-2.72	0.000	- 3.9
MU PHE	0	40	14.484	-0.165	-46	12	39.89	0.53	0.000	+ 19.0
LAC 181	0	41	30.788	-0.001	-36	8	53.61	1.55	0.000	
BET CET	0	42	26.088	1.627	-18	6	45.64	3.64	0.057	+ 13.1
ETA PHE	0	42	19.472	-0.023	-57	35	20.65	1.56	0.039	+ 2.0
LAM2 SCL	0	43	5.438	2.025	-38	32	53.61	12.07	0.000	+ 26.6
OMI CAS	0	43	26.131	0.191	+48	9	31.69	-0.26	0.000	- 13.0
21 CAS	0	44	6.160	-0.437	+74	51	45.68	-1.94	0.000	+ 8.1
70G PHE	0	43	51.926	-0.803	-42	48	6.53	-10.06	0.000	+ 12.0
ZET AND	0	46	6.928	-0.727	+24	8	32.39	-7.76	0.032	- 23.7
79G CET	0	46	52.772	0.176	-21	50	52.13	-0.65	0.000	+ 20.9

TABLE 1 CONTINUED

V	MAGNITUDE AND COLORS				SPECTRAL		FK4 #	HD #	BS #	GC #
	U-V	B-V	V-R	V-I	TYPE					
+4.56	-0.16	-0.04	+0.03	-0.01	B9.5IV	905	225132	9098	23	
+5.59	-0.54	-0.12			B8III	1001	225253	9108	42	
+4.61	+1.91	+1.04	+0.78	+1.32	K1III	1002	28	3	59	
+6.18		+0.38			A7V	1003	203	9	98	
+2.06	-0.58	-0.11	-0.03	-0.13	B8IV	1	358	15	127	
+2.27	+0.46	+0.34	+0.31	+0.51	F2IV	2	432	21	147	
+3.88	+1.87	+1.03	+0.75	+1.27	K0III	3	496	25	158	
+5.04	+0.66	+0.40	+0.42	+0.71	F2II	4	571	27	169	
+5.42		+1.35			K5III	5	720	34	197	
+5.25		+0.44			F4V	6	739	35	202	
+2.84	-1.09	-0.23	-0.10	-0.29	B2IV	7	886	39	238	
+4.80	+3.50	+1.57	+1.34	+2.47	M2III	1004	1013	45	270	
+4.52	+0.12	+0.05	+0.08	+0.08	A2V	1005	1404	68	362	
+5.74	-0.01	-0.01			A0IV	1006	1439	71	373	
+3.55	+2.39	+1.22	+0.85	+1.44	K2III	9	1522	74	388	
+4.23	+0.60	+0.58	+0.49	+0.83	G2V	10	1581	77	401	
+6.72		+1.28			K0	1007	1588		403	
+5.37	+2.89	+1.34			K0	1008	1635	80	413	
+5.15	+0.47	+0.43			F5IV	1009	1671	82	425	
+5.77	+1.43	+0.86			G5	1010	2114	97	496	
+2.80	+0.73	+0.62	+0.50	+0.84	G1IV	11	2151	98	503	
+2.40	+1.97	+1.09	+0.81	+1.40	K0III	12	2261	99	519	
+7.25		+1.42			M3	1011	2438		545	
+6.09	+3.66	+1.61			K2	1012	2436	106	548	
+5.72	+3.46	+1.56			M0III	13	2637	117	584	
+5.19		+0.12			A5V	14	2696	118	590	
+4.77	+0.06	+0.02			A0V	15	2834	125	619	
+4.16	-0.66	+0.14	+0.14	+0.20	B1IA	16	2905	130	645	
+5.55		+1.27			K2III	1013	3059	138	665	
+5.57		+0.46			F5	1014	3158	140	683	
+3.66	-1.08	-0.19	-0.08	-0.29	B2V	17	3360	153	727	
+4.36	-0.71	-0.16	-0.04	-0.16	B5V	18	3369	154	729	
+4.38	+1.34	+0.87	+0.68	+1.19	G8III	19	3546	163	759	
+3.28	+2.76	+1.28	+0.92	+1.58	K3III	20	3627	165	774	
+2.23	+2.29	+1.17	+0.78	+1.38	K0II	21	3712	168	792	
+4.59	+1.69	+0.97	+0.75	+1.27	G8III	1015	3919	180	823	
+7.06		+1.61			M0	1016	4053		845	
+2.02	+1.89	+1.01	+0.72	+1.23	K0III	22	4128	188	865	
+4.36	-0.02	+0.00			A0IV	23	4150	191	866	
+5.86		+1.20			K1III	26	4211	195	879	
+4.50	-0.59	-0.06	+0.05	+0.00	B2V	25	4180	193	882	
+5.66	+0.12	+0.05			A2IV	24	4161	192	891	
+5.94		+0.28			A7IV	1017	4293	198	900	
+4.06	+1.99	+1.12	+0.85	+1.44	K1II	27	4502	215	940	
+5.57	-0.18	-0.06			B9V	1018	4622	220	957	



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